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मानक

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“Step Out From the Old to the New”

IS 5475-2 (1979): Polystyrene Film Dielectric Capacitors, Part 2: Type FCPS 1 [LITD 5: Semiconductor and Other Electronic Components and Devices]



“ज्ञान से एक नये भारत का निर्माण”

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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

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“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

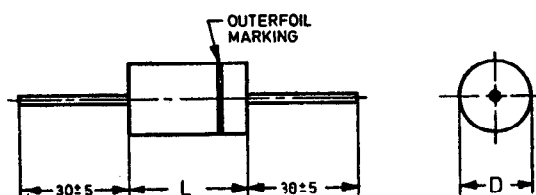
SPECIFICATION FOR POLYSTYRENE FILM DIELECTRIC CAPACITORS

PART II TYPE FCPS 1

0. General — This Indian Standard shall be read in conjunction with IS : 5475 (Part I) - 1978 'Specification for polystyrene film dielectric capacitors: Part I General requirements and methods of tests (*first revision*)'.

1. Scope — Covers polystyrene film dielectric capacitors, tubular, non-hermetically sealed in non-metal case, insulated, extended foil low inductance axial terminations, wrap and fill type.

2. Outline Drawing and Dimensions — The outline drawing and dimensions shall be according to Fig. 1 and Table 1.



All dimensions in millimetres.

Typical Construction: Non-hermetically sealed, tape wrapped and filled or moulded.

FIG. 1 OUTLINE DRAWING AND DIMENSIONS

3. Ratings — Ratings shall be as specified in Table 1.

4. Characteristics

a) Selection tolerance	$\pm 0.5, 1, 2, 5$ percent or ± 1 pF whichever is greater
b) Stability class	± 0.5 percent
c) Temperature coefficient	-100 ± 50 ppm/ $^{\circ}$ C
d) Vibration	10 — 2 000 Hz, 200 m/s ²
e) Bump	4 000 bumps, 40 g
f) Shock	1 km/s ²
g) Acceleration	1 km/s ²
h) Climatic category	55/70/56
j) Low air pressure	1 kPa

5. Marking — See 7 of IS : 5475 (Part I) - 1978.

6. Material, Construction and Workmanship — See 5 of IS : 5475 (Part I) - 1978.

7. Classification of Tests — See 8.1 of IS : 5475 (Part I) - 1978.

7.1 General Conditions of Tests — See 8.2 of IS : 5475 (Part I) - 1978. The same measuring set shall be used for any one test but not necessarily for all the tests.

7.1.1 Mounting — The capacitors shall be mounted by a bracket or clamp, or they shall be potted when vibration or shock are likely to be encountered in use. When a clamp or bracket is used, case shall be taken to ensure that the body of the capacitor is not deformed.

7.1.2 The test schedule and the requirements shall be in accordance with Table 2.

TABLE 1 DIMENSIONS AND RATINGS

(Clauses 2 and 3)

63V DC				100V DC			
Capacitance (pF)	D (Max)	L (Max)	d +10 percent -0.05 mm	Capacitance (pF)	D (Max)	L (Max)	d +10 percent -0.05 mm
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
100—8 200	7.0	17.5	0.6	100—2 500	7.0	17.5	0.8
8 201—20 000	9.0	17.5	0.6	2 501—20 000	9.0	17.5	0.8
20 001—35 000	11.0	17.5	0.6	20 001—55 000	11.0	22.0	0.8
35 001—55 000	13.0	17.5	0.6	55 001—110 000	13.0	27.0	0.8
55 001—85 000	13.0	22.0	0.8	110 001—250 000	15.0	32.0	0.8
85 001—130 000	15.0	22.0	0.8	250 001—340 000	16.5	38.0	0.8
130 001—180 000	16.5	22.0	0.8	340 001—460 000	16.5	48.0	0.8
180 001—280 000	16.5	27.0	0.8	460 001—600 000	18.5	48.0	0.8
280 001—350 000	19.0	27.0	0.8				
350 001—500 000	19.0	32.0	0.8				
500 001—600 000	22.0	32.0	0.8				
250V DC				630V DC			
100—1 000	7.0	17.5	0.8	100—500	7.0	17.5	0.8
1 001—7 000	9.0	17.5	0.8	501—2 500	9.0	17.5	0.8
7 001—25 000	11.0	22.0	0.8	2 501—9 500	11.0	22.0	0.8
25 001—50 000	13.0	27.0	0.8	9 501—20 000	13.0	27.0	0.8
50 001—100 000	15.0	32.0	0.8	20 001—42 000	15.0	32.0	0.8
100 001—150 000	16.5	38.0	0.8	42 001—60 000	17.0	38.0	0.8
150 001—200 000	16.5	48.0	0.8	60 001—80 000	17.0	48.0	0.8
200 001—260 000	19.0	48.0	0.6	80 001—105 000	19.5	48.0	0.8
260 001—350 000	22.0	48.0	0.8	105 001—145 000	22.0	48.0	0.8
350 001—500 000	25.5	48.0	0.8	145 001—210 000	26.0	48.0	0.8

TABLE 2 TEST SCHEDULE AND REQUIREMENTS
(Clause 7.1.2)

SI No.	Test	Clause Ref in IS : 5475 (Part I)-1978	Condition of Test	Requirement
(1)	(2)	(3)	(4)	(5)
I) Group 0				
a)	Visual examination	8.4.1	—	The workmanship and finish shall be satisfactory. The marking shall be legible
b)	Dimensions	8.4.2	—	The dimensions of the capacitors and their terminations shall conform to values given in Table 1 read with Fig. 1
c)	Capacitance	8.3.2	—	The capacitance value at 25°C shall correspond with the rated capacitance, taking into account the tolerance
d)	Tangent of loss angle	8.3.3	—	The tangent of loss angle shall not exceed 5×10^{-4}
e)	Outer foil termination	8.3.7	—	Outer foil termination shall be correctly marked
f)	Inductance	8.3.6	—	The inductance shall not exceed 10 nH
g)	Voltage proof	8.3.1	—	There shall be no breakdown, spark or flashover
h)	Insulation resistance	8.3.4	—	a) 100 000 MΩ between terminations b) 50 000 MΩ between body and terminations
II) First Group				
a)	Solderability	8.4.4.1	—	—
b)	Robustness of terminations	8.4.3	—	—
	i) Visual examination	8.4.1	—	There shall be no damage
c)	Bump	8.4.6	4 000 bumps, 40 g	—
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Capacitance	8.3.2	—	The change in capacitance value shall not exceed ± 0.5 percent
	3) Tangent of loss angle	8.3.3	—	As in Group 0
	4) Insulation resistance	8.3.4	—	As in Group 0
d)	Vibration	8.4.5	10-2 000 Hz, 200 m/s ²	—
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Capacitance	8.3.2	—	The change in capacitance value shall not exceed ± 0.5 percent
	3) Tangent of loss angle	8.3.3	—	As in Group 0
	4) Insulation resistance	8.3.4	—	As in Group 0
e)	Shock	8.4.7	1 km/s ² , Pulse duration, 11 milliseconds	—
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Capacitance	8.3.2	—	The change in capacitance value shall not exceed ± 0.5 percent
	3) Tangent of loss angle	8.3.3	—	As in group 0
	4) Insulation resistance	8.3.4	—	As in Group 0
f)	Acceleration (steady state)	8.4.8	1 km/s ²	—
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Capacitance	8.3.2	—	The change in capacitance value shall not exceed ± 0.5 percent

(Continued)

TABLE 2 TEST SCHEDULE AND REQUIREMENTS — Contd

SI No.	Test	Clause Ref in IS : 5475 (Part I)-1978	Condition of Test	Requirement
(1)	(2)	(3)	(4)	(5)
	3) Tangent of loss angle	8.3.3	—	As in Group 0
	4) Insulation resistance	8.3.4	—	As in Group 0
g)	Rapid change of temperature	8.5.3	—	—
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Capacitance	8.3.2	—	Change in capacitance value shall not exceed ± 0.5 percent
	3) Tangent of loss angle	8.3.3	—	The tangent of loss angle shall not exceed 5×10^{-4}
	4) Insulation resistance	8.3.4	—	As in Group 0
h)	Climatic sequence	8.5.1	—	—
	1) Dry heat	8.5.1.2	—	—
	i) Insulation resistance (hot)	8.3.4	At maximum category temperature	a) 40 000 M Ω minimum between terminations b) 12 500 M Ω minimum between body and terminations
	ii) Capacitance	8.3.2	To be measured within two hours of removal from chamber	The change in capacitance value shall not exceed ± 0.5 percent
	iii) Tangent of loss angle	8.3.3	—	As in Group 0
	2) Damp heat (accelerated) first cycle	8.5.1.3	—	—
	3) Cold	8.5.1.4	Two hours at minimum category temperature	—
	i) Visual examination	8.4.1	—	There shall be no damage
	4) Low air pressure	8.5.1.5	Degree of severity 1 kPa	There shall be no breakdown or spark or flashover
	5) Damp heat (accelerated) remaining cycles	8.5.1.6	—	—
	i) Visual examination	8.4.1	—	There shall be no damage
	ii) Voltage proof	8.3.1	—	There shall be no breakdown or spark or flashover
	iii) Insulation resistance	8.3.4	—	Not less than 50 percent of the value specified in Group 0
	iv) Capacitance	8.3.2	—	Change in capacitance value shall not exceed ± 0.5 percent
	v) Tangent of loss angle	8.3.3	—	The tangent of loss angle shall not exceed 5×10^{-4}
III)	Second Group			
	a) Damp heat (long term)	8.5.2	—	—
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Voltage proof	8.3.1	—	There shall be no breakdown, spark or flashover
	3) Insulation resistance	8.3.4	—	Not less than 50 percent of the value specified in Group 0

(Continued)

TABLE 2 TEST SCHEDULE AND REQUIREMENTS — *Contd*

SI No.	Test	Clause Ref in IS : 5475 (Part I)-1978	Condition of Test	Requirement
(1)	(2)	(3)	(4)	(5)
	4) Capacitance	8.3.2	—	Change in capacitance value shall not exceed ± 0.5 percent
	5) Tangent of loss angle	8.3.3	—	The tangent of loss angle shall not exceed 5×10^{-4}
	6) Solderability	8.4.4.1	—	—
IV) Third Group				
	a) Dielectric absorption*	—	—	0.1 percent
	b) Storage at temperature (cold)	9.3	—	—
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Capacitance	8.3.2	—	Change in capacitance value shall not exceed ± 5 percent
	c) Endurance	9.2	2 000 hours	—
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Capacitance	8.3.2	—	Change in capacitance value shall not exceed ± 0.5 percent
	3) Tangent of loss angle	8.3.3	—	As in Group 0
	4) Voltage proof	8.3.1	—	There shall be no breakdown or spark or flashover
	5) Insulation resistance	8.3.4	—	As in Group 0
V) Fourth Group				
	a) Mould growth	8.5.4	—	—
VI) Fifth Group				
	a) Resistance to solvents	9.4	—	—
	b) Resistance to steam	—	The capacitor shall be exposed to a saturated steam atmosphere of 35 kPa (gauge pressure) for a period of 90 minutes. The terminals shall not be welded, soldered or disfigured	There shall be no evidence of unwrapping of the capacitor case or sleeve, or other damage to the case
	c) Resistance to soldering heat	8.4.4.2	—	—
	1) Capacitance	8.3.2	—	The change in capacitance value shall not exceed ± 5 percent
	2) Tangent of loss angle	8.3.3	—	The tangent of loss angle shall not exceed 5×10^{-4}
VII) Sixth Group				
	a) Temperature coefficient	8.3.5	—	(-100 ± 50) ppm/°C
	b) Salt mist	8.5.5	96 hours	—
	1) Visual examination	8.4.1	—	There shall be no damage
	2) Voltage proof	8.3.1	—	There shall be no breakdown or spark or flashover
	3) Insulation resistance	8.3.4	—	As in Group 0

*Not applicable to values of 0.01 μ F or less.

EXPLANATORY NOTE

While preparing this standard assistance has been derived from JSS: 50211 issued by Department of Defence Production, Ministry of Defence, New Delhi. The corresponding JSS pattern is CRYO2.